

**Table 11-3. Contaminants Posing Potentially Unacceptable Risks by River Mile in Selected Media**

<b>River Mile</b>	<b>Sample Type</b>	<b>Contaminants Posing Potentially Unacceptable Risk (Maximum HQ within river mile)</b>
1.9 - 2.99	Sediment <sup>a</sup>	<p><b>Metals (3<sup>c</sup>):</b> Chromium (2.5<sup>d</sup>), Lead (1.2), Zinc (2.6)</p> <p><b>PAH's (14):</b> 2-Methylnaphthalene (2.7), Acenaphthene (130), Acenaphthylene (8.6), Anthracene (57), Benzo(a)anthracene (26), Benzo(a)pyrene (10), Chrysene (13), Dibenz(a,h)anthracene (5.7), Fluoranthene (13), Fluorene (69), Naphthalene (1.8), Phenanthrene (170), Pyrene (45), Total PAH's (11)</p> <p><b>PCB's (2):</b> Total PCB's (6.9), Aroclor 1254 (1.5)</p> <p><b>Pesticides (7):</b> 4,4'-DDD (2.2), 4,4'-DDT (5.4), Sum DDD's (3.7), Sum DDE's (1.0), Sum DDT's (5.5), Dieldrin (1.4), Total Chlordanes (2.0)</p> <p><b>Petroleum hydrocarbons (2):</b> Diesel range hydrocarbons (29), Residual range hydrocarbons (1.5)</p>
	Surface Water <sup>b</sup>	2,4' DDT (19, 1.7), 4,4'-DDT (1.9, 0.17), Total DDx (20, 1.8)
	Transition Zone Water	No TZW samples collected within this river reach
	Bivalves <sup>e</sup>	Copper (1.4), Zinc (1.7)
	Smallmouth Bass	Total PCB's (1.5)
3.0 - 3.99	Sculpins	Total PCB's (3.7), bis(2-ethylhexyl)phthalate (1.0)
	Sediment <sup>a</sup>	<p><b>Metals (4):</b> Chromium (1.3), Lead (2.2), Nickel (1.2), Zinc (2.3)</p> <p><b>PAH's (14):</b> 2-Methylnaphthalene (1.7), Acenaphthene (10), Acenaphthylene (2.3), Anthracene (17), Benzo(a)anthracene (16), Benzo(a)pyrene (4.9), Chrysene (8.7), Dibenz(a,h)anthracene (3.0), Fluoranthene (6.7), Fluorene (5.8), Naphthalene (2.5), Phenanthrene (16), Pyrene (13), Total PAH's (2.9)</p> <p><b>PCB's (2):</b> Total PCB's (13), Aroclor 1254 (6.2)</p> <p><b>Pesticides (8):</b> 4,4'-DDD (3.5), 4,4'-DDE (2.7), 4,4'-DDT (44), Sum DDD's (3.6), Sum DDE's (3.1), Sum DDT's (48), γ-Hexachlorocyclohexane (Lindane) (4.3), Total Chlordanes (2.2)</p> <p><b>Petroleum hydrocarbons (3):</b> Gasoline range hydrocarbons (1.1), Diesel range hydrocarbons (14), Residual range hydrocarbons (5.7)</p>
	Surface Water <sup>b</sup>	Total PCB's (1.1, 0.078), 4,4'-DDT (1.9, 0.18), Total DDx's (3.2, 0.29)
	Transition Zone Water	No TZW samples collected within this river reach
	Bivalves	Copper (1.4), Zinc (2.0)
	Smallmouth Bass	bis(2-ethylhexyl)phthalate (220), Total PCB's (1.6)
	Sculpins	None

4.0 - 4.99	Sediment <sup>a</sup>	<p><b>Metals (7):</b> Cadmium (2.9), Chromium (2.6), Copper (1.4), Lead (21), Mercury (1.5), Nickel (2.2), Zinc (6.5)</p> <p><b>PAH's (14):</b> 2-Methylnaphthalene (4.7), Acenaphthene (120), Acenaphthylene (3.5), Anthracene (36), Benzo(a)anthracene (110), Benzo(a)pyrene (61), Chrysene (51), Dibenz(a,h)anthracene (48), Fluoranthene (29), Fluorene (24), Naphthalene (4.3), Phenanthrene (62), Pyrene (85), Total PAH's (21)</p> <p><b>PCB's (1):</b> Total PCB's (6.1)</p> <p><b>Pesticides (8):</b> 4,4'-DDD (5.3), 4,4'-DDE (1.5), 4,4'-DDT (32), Sum DDD's (6.8), Sum DDE's (1.8), Sum DDT's (32), <math>\gamma</math>-Hexachlorocyclohexane (Lindane) (1.8), Chlordane (cis and trans) (2.9)</p> <p><b>Petroleum hydrocarbons (3):</b> Gasoline range hydrocarbons (1.4), Diesel range hydrocarbons (8.3), Residual range hydrocarbons (2.0)</p>
	Surface Water <sup>b</sup>	<p>bis(2-ethylhexyl)phthalate (2.3), 2,4'-DDT (1.1, 0.10), 4,4'-DDT (2.5, 0.23), Total DDx (3.9, 0.35)</p>
	Transition Zone Water	<p><b>Metals (4):</b> Barium (73), Iron (75), Manganese (72), Zinc (14)</p> <p><b>PAH's (2):</b> Benzo(a)anthracene (5.6), Benzo(a)pyrene (15)</p> <p><b>Petroleum hydrocarbons (1):</b> Aliphatic hydrocarbons C<sub>10</sub> - C<sub>12</sub> (32)</p>
	Bivalves	Copper (1.4), Zinc (1.6)
5.0 - 5.99	Smallmouth Bass	Total PCB's (1.6)
	Sculpins	bis(2-ethylhexyl)phthalate (24)
	Sediment <sup>a</sup>	<p><b>Metals (7):</b> Arsenic (1.3), Chromium (2.4), Copper (4.1), Lead (3.6), Mercury (10), Nickel (3.3), Zinc (2.2)</p> <p><b>PAH's (14):</b> 2-Methylnaphthalene (230), Acenaphthene (4800), Acenaphthylene (420), Anthracene (1600), Benzo(a)anthracene (830), Benzo(a)pyrene (430), Chrysene (430), Dibenz(a,h)anthracene (190), Fluoranthene (540), Fluorene (1500), Naphthalene (190), Phenanthrene (3300), Pyrene (1500), Total PAH's (320)</p> <p><b>PCB's (1):</b> Total PCB's (1.5)</p> <p><b>Pesticides (8):</b> 4,4'-DDD (16), 4,4'-DDE (2.1), 4,4'-DDT (44), Sum DDD's (16), Sum DDE's (3.4), Sum DDT's (58), <math>\gamma</math>-Hexachlorocyclohexane (Lindane) (6.2), Total chlordane (2.2)</p> <p><b>Petroleum hydrocarbons (3):</b> Gasoline range hydrocarbons (3.3), Diesel range hydrocarbons (39), Residual range hydrocarbons (2.9)</p>
	Surface Water <sup>b</sup>	4,4'-DDD (1.1, 0.10), 4,4'-DDT (3.3, 0.30), Total DDx (4.4, 0.40)
Transition Zone Water	<p><b>Metals (6):</b> Barium (88), Beryllium (1.8), Cadmium (1.1), Iron (110), Lead (3.0), Manganese (150)</p> <p><b>PAH's (6):</b> Benzo(a)anthracene (8.5), Benzo(a)pyrene (25), Benzo(g,h,i)perylene (1.1), Fluorene (1.5), Indeno(1,2,3-cd)pyrene (1.2), Phenanthrene (2.4)</p>	

		<b>VOC's (1):</b> Acrolein (30)
		<b>Petroleum hydrocarbons (2):</b> Aliphatic hydrocarbons C <sub>4</sub> - C <sub>6</sub> (1.1), Aliphatic hydrocarbons C <sub>10</sub> - C <sub>12</sub> (85)
	Bivalves	Copper (1.5), Zinc (1.3)
	Smallmouth Bass	None
	Sculpins	Copper (1.1)
6.0 - 6.99	Sediment	<b>Metals (7):</b> Arsenic (3.2), Chromium (2.2), Copper (4.1), Lead (150), Mercury (140), Nickel (5.6), Zinc (3.5)
		<b>PAH's (14):</b> 2-Methylnaphthalene (260), Acenaphthene (2000), Acenaphthylene (94), Anthracene (650), Benzo(a)anthracene (310), Benzo(a)pyrene (200), Chrysene (160), Dibenz(a,h)anthracene (110), Fluoranthene (160), Fluorene (760), Naphthalene (260), Phenanthrene (780), Pyrene (510), Total PAH's (110)
		<b>PCB's (2):</b> Aroclor 1254 (1.1), Total PCB's (12)
		<b>Pesticides (11):</b> 4,4'-DDD (120), 4,4'-DDE (130), 4,4'-DDT (100), Sum DDD's (160), Sum DDE's (130), Sum DDT's (100), Total DDx (3.0), Dieldrin (1.7), γ-Hexachlorocyclohexane (Lindane) (16), Heptachlor epoxide (5.1), Total chlordane (28)
		<b>Petroleum hydrocarbons (3):</b> Gasoline range hydrocarbons (21), Diesel range hydrocarbons (220), Residual range hydrocarbons (14)
	Surface Water <sup>b</sup>	Benzo(a)anthracene (10), Benzo(a)pyrene (14), Naphthalene (50), bis(2-ethylhexyl)phthalate (1.2), Total PCB's (1.2, 0.089), 2,4'-DDD (2.1, 0.19), 4,4'-DDD (3.1, 0.28), 4,4'-DDT (2.9, 0.26), Total DDx (7.7, 0.70), Ethylbenzene (1.6), Trichloroethene (4.1)
	Transition Zone Water	<b>Metals (7):</b> Barium (86), Cobalt (3.6), Iron (180), Lead (1.7), Manganese (130), Nickel (1.1), Vanadium (19)
		<b>PAH's (16):</b> 2-Methylnaphthalene (40), Acenaphthene (17), Anthracene (87), Benzo(a)anthracene (1200), Benzo(a)pyrene (2700), Benzo(b)fluoranthene (49), Benzo(k)fluoranthene (14), Benzo(g,h,i)perylene (66), Chrysene (17), Dibenz(a,h)anthracene (13), Fluoranthene (17), Fluorene (28), Indeno(1,2,3-cd)pyrene (61), Naphthalene (1100), Phenanthrene (57), Pyrene (15)
		<b>SVOC's (1):</b> Dibenzofuran (2.2)
		<b>VOC's (13):</b> 1,1-Dichloroethene (1.6), 1,2,4-Trimethylbenzene (9.6), 1,3,5-Trimethylbenzene (3.0), Benzene (30), Carbon disulfide (870), cis-1,2-Dichloroethene (110), Ethylbenzene (57), Isopropylbenzene (2.0), m,p-Xylene (4.4), o-Xylene (12), Total Xylenes (34), Toluene (18), Trichloroethene (1900)

		<p><b>Petroleum hydrocarbons (4):</b> Aliphatic hydrocarbons C<sub>4</sub> - C<sub>6</sub> (7.3), Aliphatic hydrocarbons C<sub>6</sub> - C<sub>8</sub> (4.3), Aliphatic hydrocarbons C<sub>10</sub> - C<sub>12</sub> (540), Aromatic hydrocarbons C<sub>8</sub> - C<sub>10</sub> (2.7)</p> <p><b>Conventionals (1):</b> Cyanide (4400)</p> <p>Copper (1.5), Zinc (1.6), Total PCB's (2.0)</p> <p>Total PCB's (2.2), Total DDx (1.1)</p> <p>Total PCB's (2.6)</p> <p><b>Metals (6):</b> Arsenic (4.4), Chromium (3.0), Copper (4.2), Lead (14), Nickel (5.0), Zinc (8.4)</p> <p><b>PAH's (12):</b> Acenaphthene (2.4), Acenaphthylene (11), Anthracene (4.5), Benzo(a)anthracene (42), Benzo(a)pyrene (15), Chrysene (22), Dibenz(a,h)anthracene (29), Fluoranthene (7.6), Fluorene (5.0), Phenanthrene (9.5), Pyrene (15), Total PAH's (6.6)</p> <p><b>PCB's (1):</b> Total PCB's (2.8)</p> <p><b>Pesticides (11):</b> 4,4'-DDD (330), 4,4'-DDE (170), 4,4'-DDT (2500), Sum DDD's (360), Sum DDE's (190), Sum DDT's (2700), Total DDx (28), Dieldrin (1.9), γ-Hexachlorocyclohexane (Lindane) (310), Heptachlor epoxide (6.2), Total chlordane (75)</p> <p><b>Petroleum hydrocarbons (1):</b> Diesel range hydrocarbons (5.5)</p> <p>2,4'-DDD (1.4, 0.12), 4,4'-DDD (3.3, 0.30), 4,4'-DDT (3.9, 0.35), Total DDx (9.8, 0.89)</p> <p><b>Metals (11):</b> Barium (1100), Beryllium (2.0), Cadmium (5.8), Copper (1.3), Iron (250), Lead (2.8), Magnesium (7.0), Manganese (550), Nickel (1.6), Potassium (3.7), Sodium (55)</p> <p><b>PAH's (1):</b> Naphthalene (2.2)</p> <p><b>SVOC's (2):</b> 1,2-Dichlorobenzene (46), 1,4-Dichlorobenzene (16)</p> <p><b>Pesticides (6):</b> 2,4'-DDD (1100), 2,4'-DDT (93), 4,4'-DDD (1300), 4,4'-DDE (120), 4,4'-DDT (1800), Total DDx (3100)</p> <p><b>VOC's (2):</b> Chlorobenzene (190), Chloroform (21)</p> <p><b>Petroleum hydrocarbons (1):</b> Aliphatic hydrocarbons C<sub>10</sub> - C<sub>12</sub> (3.8)</p> <p><b>Conventionals (1):</b> Perchlorate (19)</p> <p>Copper (1.3), Zinc (1.7)</p> <p>Total PCB's (2.2), Total DDx (1.1)</p> <p>Total DDx (2.4)</p> <p>4,4'-DDT (2.9, 0.26), Total DDx (4.3, 0.39)</p> <p><b>Metals (3):</b> Barium (68), Iron (91), Manganese (43)</p> <p><b>VOC's (1):</b> Chloroethane (3.4)</p> <p>Copper (1.2), Zinc (1.9)</p>
7.0 - 7.99	<p>Bivalves</p> <p>Smallmouth Bass</p> <p>Sculpins</p> <p>Sediment</p>	
	<p>Surface Water<sup>b</sup></p> <p>Transition Zone Water</p>	
8.0 - 8.99	<p>Bivalves</p> <p>Smallmouth Bass</p> <p>Sculpins</p> <p>Sediment</p> <p>Surface Water<sup>b</sup></p> <p>Transition Zone Water</p> <p>Bivalves</p>	

Swan Island Lagoon	Smallmouth Bass	Total PCB's (1.0)
	Sculpins	None
	Sediment	
	Surface Water	None
	Transition Zone Water	No TZW samples collected within this river reach
	Bivalves	Copper (1.8), Zinc (2.2), Tributyltin (3.5)
9.0 - 9.99	Smallmouth Bass	Total PCB's (5.3)
	Sculpins	bis(2-ethylhexyl)phthalate (72)
	Sediment	<b>Metals (7):</b> Cadmium (13), Chromium (1.1), Copper (2.7), Lead (10), Mercury (1.6), Nickel (1.7), Zinc (9.0) <b>PAH's (13):</b> 2-Methylnaphthalene (1.5), Acenaphthene (7.1), Acenaphthylene (3.9), Anthracene (5.5), Benzo(a)anthracene (14), Benzo(a)pyrene (3.3), Chrysene (13), Dibenz(a,h)anthracene (4.9), Fluoranthene (17), Fluorene (6.7), Phenanthrene (22), Pyrene (34), Total PAH's (4.8)  <b>PCB's (2):</b> Aroclor 1254 (4.9), Total PCB's (9.0) <b>Pesticides (8):</b> 4,4'-DDD (4.8), 4,4'-DDE (2.9), 4,4'-DDT (10), Sum DDD's (8.4), Sum DDE's (9.2), Sum DDT's (17) $\gamma$ -Hexachlorocyclohexane (Lindane) (5.3), Total chlordane (21) <b>Petroleum hydrocarbons (3):</b> Gasoline range hydrocarbons (1.8), Diesel range hydrocarbons (25), Residual range hydrocarbons (2.1)
	Surface Water <sup>b</sup>	Zinc (1.1), 4,4'-DDT (4.7, 0.43), Total DDx (5.9, 0.54)
	Transition Zone Water	No TZW samples collected within this river reach
	Bivalves	Copper (1.2), Zinc (1.6)
10.0 - 10.99	Smallmouth Bass	Antimony (5.4), Lead (280), bis(2-ethylhexyl)phthalate (7.2), Total PCB's (1.0)
	Sculpins	None
	Sediment	<b>Metals (6):</b> Arsenic (2.5), Copper (2.1), Lead (2.6), Mercury (2.2), Nickel (1.2), Zinc (2.4) <b>PAH's (7):</b> Acenaphthene (4.7), Benzo(a)anthracene (1.6), Benzo(a)pyrene (1.2), Dibenz(a,h)anthracene (1.7), Fluorene (2.8), Phenanthrene (1.9), Pyrene (2.1) <b>PCB's (2):</b> Aroclor 1254 (1.4), Total PCB's (3.4) <b>Pesticides (6):</b> 4,4'-DDT (2.5), Sum DDD's (1.6), Sum DDT's (2.7), $\gamma$ -Hexachlorocyclohexane (Lindane) (6.9), Heptachlor epoxide (1.1), Total chlordane (2.0) <b>Petroleum hydrocarbons (2):</b> Gasoline range hydrocarbons (1.1), Diesel range hydrocarbons (3.2)
	Surface Water	Monobutyltin (1.2)
	Transition Zone Water	No TZW samples collected within this river reach

11.0 - 11.8	Bivalves	Zinc (1.4)
	Smallmouth Bass	Antimony (5.4), Lead (280), bis(2-ethylhexyl)phthalate (7.2), Total PCB's (7.1)
	Sculpins	Copper (2.3)
	Sediment	<b>Metals (4):</b> Chromium (2.1), Copper (19), Lead (5.1), Nickel (2.1)
		<b>PAH's (6):</b> 2-Methylnaphthalene (2.2), Acenaphthene (1.8), Anthracene (1.1), Fluorene (1.6), Phenanthrene (2.9), Pyrene (1.1)
		<b>PCB's (2):</b> Aroclor 1254 (3.8), Total PCB's (22)
		<b>Pesticides (6):</b> 4,4'-DDT (75), Sum DDD's (10), Sum DDT's (80), $\gamma$ -Hexachlorocyclohexane (Lindane) (3.8), Heptachlor epoxide (6.2), Total chlordane (21)
		<b>Petroleum hydrocarbons (2):</b> Diesel range hydrocarbons (1.7), Residual range hydrocarbons (1.3)
	Surface Water	Monobutyltin (1.2)
	Transition Zone Water	No TZW samples collected within this river reach
Bivalves	Zinc (1.1)	
Smallmouth Bass	Bis(2-ethylhexyl)phthalate (7.2), Total PCB's (7.1)	
Sculpins	Copper (1.7), Total PCB's (9.4)	

a - Based on exceedances of probable effect concentrations (PEC's), probable effect levels (PEL's) and petroleum hydrocarbon TRV's only

b - Two water TRV's exist for PCB's and DDX's. See discussion in BERA Section 6.5.4 for the rationale for having two TRV's

c - Based on exceedances of probable effect concentrations (PEC's) and probable effect levels (PEL's) only

d- Value in parenthesis is the maximum hazard quotient for each contaminant within each river mile segment of the Study Area

e - Field collected clams and mussels